AF/1754

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Serial No.: 09/735,930

In re Application of

Confirmation No. 5806

NAOMI NODA, et al.

Group Art Unit: 1754

Filed: December 14, 2000

Examiner: Stuart L. Hendrickson

For: CATALYST BODY

BRIEF ON APPEAL

BOARD OF PATENT APPEALS AND INTERFERENCES
U.S. PATENT AND TRADEMARK OFFICE
P. O. Box 1450
Alexandria, Virginia 22313-1450

Submitted herewith is a Brief on Appeal in the above-identified application.

The PTO is authorized to charge the amount of $500 to cover the necessary fee under 37 CFR 41.20(b)(2) from Deposit Account No. 19-4293. Please apply any other charges or credits as necessary to Deposit Account No. 19-4293.

Respectfully submitted,

STEPTOE & JOHNSON, L.L.P.

Date: April 20, 2007

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Attorney Docket No. 28953.7205

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BRIEF ON APPEAL

Appellants' Notice of Appeal filed February 17, 2007 appeals the final rejection of claims 12, 14 and 15 as stated in the Office Action dated November 17, 2006. Appellants request that the rejection of these claims be reversed for the reasons stated herein.

I. Real Party in Interest

The real party in interest is NGK Insulators, Inc., owner of this application by an Assignment recorded in the PTO on January 16, 2001 at Reel 011433, Frame 0529.

II. Related Appeals and Interferences

There is no appeal, interference, or other judicial proceeding known to appellants, the undersigned, or the assignee, that may be related to, directly affect, or be directly affected by or have a bearing on the Board's decision in this case.

III. Status of Claims

The application was filed with eight (8) claims. An Amendment filed November 8, 2002 amended claims 1-6. Claim 1 was further revised, and new claims 9-11 were added in an Amendment filed June 27, 2003. Claims 3 and 11 were amended, and claims 4 and 6 were canceled in an Amendment filed January 9, 2004. An Amendment filed June 21, 2004 canceled claims 1-11 and added new claims 12-23, and the next Amendment filed July 27, 2004 amended claims 12, 13, 16, 17, 20 and 21. Claims 12 and 16 were amended and claim 17 was canceled in an Amendment filed November 30,

2004. Claims 12 and 20 were then amended in an Amendment filed January 5, 2005. An Amendment filed July 27, 2005 amended claims 12, 16 and 20 and canceled claim 13. Claims 12, 16 and 20 were again amended, and claim 21 was canceled, in an Amendment filed March 13, 2006. Applicants filed a Notice of Appeal on April 13, 2006, and a Supplemental Amendment on April 14, 2006 further amending claim 16. Claims 16, 18-20, 22 and 23 were allowed, and claims 12, 14 and 15 remained rejected, in the Office Action mailed June 12, 2006. Applicants filed a Request for Reconsideration on September 11, 2006. However, claims 12, 14 and 15 remained rejected in the Office Action mailed November 17, 2006. On February 17, 2007 applicants filed a Notice of Appeal.

The claims on appeal are claims 12, 14 and 15. See the Claims Appendix hereto.

IV. Status of Amendments

No amendment awaits entry after the Office Action mailed November 17, 2006.

V. Summary of Claimed Subject Matter

Appellants' claimed invention is a catalyst body usable as an NOx adsorption catalyst. In recent years, as regulations for automobile exhaust gas have become more severe, lean burn engines and direct injection engines have been more widely used. Thus, NOx adsorption catalysts capable of effectively purifying the NOx present in an automobile exhaust gas under lean burn conditions have been put into practical use. Certain NOx adsorption components have been used in NOx adsorption catalysts, including examples of alkali metals, alkaline earth metals, and rare earth elements.

An NOx adsorption catalyst ordinarily includes (a) a carrier made of an oxide type ceramic material such as cordierite, or a metal material such as Fe--Cr--Al alloy, and (b) a catalyst layer containing a NOx adsorption component loaded on the carrier (a). The carrier, however, is easily corroded and deteriorated by alkali metals or some alkaline earth metals, especially, Li, Na, K and Ca, activated at the high temperatures of automobile exhaust gas. There is a serious problem that a cordierite ceramic carrier is susceptible to cracks and degradation because the oxide type ceramic easily reacts with such alkali and alkaline earth metals.

The catalyst body of the present invention (see claim 12) includes a honeycomb carrier having at least one main component, and a catalyst layer including an alkali metal, a heat-resistant inorganic oxide, and a noble metal loaded on the heat-resistant inorganic oxide. The catalyst layer also includes an anchor substance that reacts predominantly with the alkali metal rather than with a main component of the honeycomb carrier, and which is at least one of B, Si, P, S, Cl, V, Cr, Mn, Ga, Ge, As, Se, Br, Zr, Mo, Sn, Sb, I and W, whereby any reaction between main components of the carrier and said alkali metal is suppressed and deterioration of the carrier is therefore suppressed.

Claim 14 specifies that the noble metal loaded on the heat-resistant inorganic oxide is Pt, Pd and/or Rh.

Claim 15 specifies that the main component of the carrier is cordierite.

VI. Grounds of Rejection to be Reviewed on Appeal

1. Claims 12, 14 and 15 were rejected under 35 U.S.C. § 103(a) over Chattha U.S. Patent 5,922,295.

VII. Argument

The catalyst body of the present invention (see claim 12) includes a honeycomb carrier having at least one main component and a catalyst layer including an alkali metal, a heat-resistant inorganic oxide, and a noble metal loaded on the heat-resistant inorganic oxide. The alkali metal is thus an important element of appellants' invention.

Chattha is entitled "Sulfur-Resistant NOx Traps Containing Tungstophosphoric Acid and Precious Metal," and describes a nitrogen oxide trap comprising a porous alumina support with materials loaded on the support, including 12-tungstophosphoric acid and a precious metal such as platinum, rhodium or palladium. Chattha, col. 2, lines 38-45. But Chattha does not disclose or suggest appellants' catalyst body.

A. Background of the Chattha Invention

The "Background of the Invention" section of the Chattha patent specification states that:

> Typical of material combinations in conventional traps are an alkaline earth metal like barium with a precious metal catalyst like platinum. European Patent Applicantion 0613714A2 published Sep. 7th, 1994 discloses that platinum or palladium in various combinations with at least two ingredient materials of the alkali metals, alkaline earth metals, transition metals, or rare-earth metal are capable of storing or absorbing nitrogen oxides under exhaust conditions of excess oxygen.

Chattha, col. 1, lines 45-53.

Chattha's "Background of the Invention" does not specify any catalyst carrier, or what material any catalyst carrier comprises. Furthermore, the Chattha background does not specify any particular combination of alkali metals, alkaline earth metals, transition

metals, or rare earth metals, that should be used. Chattha fails to suggest that any anchor material be present to suppress deterioration of a carrier by an alkali metal. Chattha does not suggest preferentially reacting any anchor substance with alkali metal to protect the main component of the carrier from reacting with the alkali metal, and thereby suppress deterioration of a carrier.

B. The Chattha Invention

The description of the Chattha invention likewise fails to disclose or suggest each element of appellants' claim 12. Chattha is entirely concerned with preventing destruction of alkali metal by sulfur poisoning. Chattha completely removes any alkali metal:

> The alkali metal and alkaline earth metals which are typically utilized for NOx sorption have, however, the serious drawback that they are readily poisoned by sulfur in the exhaust gas. Most fuels for automotive vehicles contain sulfur and when burnt, the sulfur is converted to sulfur compounds like SO_2. Over time, the sulfur compounds react with these trap materials forming sulfates which will not revert back to the sorption material. These sulfates are inactive for NOx sorption. As a result, the typical NOx trap is strongly deactivated by sulfur in the fuel.

Chattha, col. 2, lines 1-10. Chattha teaches away from using alkali metal because Chattha does not use alkali metal. The Chattha invention does not include anything like applicants' claimed anchor substance for preferentially reacting with alkali metal to minimize any reaction between alkali metal and a main component of the catalyst carrier.

As shown above, there is no disclosure or teaching in the rather distinct (1) prior background and (2) alleged inventive portions, respectively, of Chattha of the problem that applicants' discovered, or the solution to that problem which applicants invented.

There is no suggestion in Chattha of using both a highly reactive alkali metal, and a different anchor substance which protects a carrier substrate from the alkali metal. That was first invented, taught and claimed by appellants, not Chattha.

C. Claim 15

The foregoing arguments even further distinguish appellants' claim 15 from Chattha, because Chattha does not recognize the protective relationship of the anchor substance to the carrier by causing the alkali metal to preferentially react with the anchor substance instead of the carrier substrate. Significantly, Chattha fails to recognize or disclose that an alkali metal is particularly corrosive to cordierite, which is thus effectively protected by the presence of an anchor sustance.

The November 17, 2006 Office Action stated:

> In any event, refined gasoline contains so little sulfur, that the small amount of poisoning is offset by greater NOx removal and thus an obvious expedient to add alkali. Not adding it gives no benefit, so adding it, getting a temporary benefit but later poisoning and losing the benefit is no worse.

Office Action, November 17, 2006, page 2. But those assumptions are not suggested by any evidence. There is no evidence in this record (a) of the amount of sulfur in refined gasoline; (b) that the amount of poisoning from using alkali metal is offset by greater NOx removal; (c) that not adding alkali gives no benefit; and (d) that adding alkali results in a getting a temporary benefit and later poisoning and losing the benefit, which is no worse than not adding alkali.

Chattha would have motivated one of ordinary skill in the art to avoid entirely alkali metal, not to modify Chattha's teachings to include it. Therefore Chattha does not

expressly disclose the complete combination of elements of any of appellants' claims 12, 14 and 15. Furthermore, there is no demonstrated motivation to modify the teachings of Chattha in the way suggested by the Examiner.

VIII Conclusion

For all the foregoing reasons, Appellants therefore respectfully request this Honorable Board to reverse the rejection and allow all claims 12, 14 and 15 herein.

Respectfully submitted,

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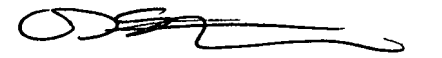

Date: April 20, 2007

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Enclosures: Appendices VIII, IX and X

RWP/CDS/cd

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VIII. Claims Appendix

12. A catalyst body comprising

(1) a honeycomb carrier having at least one main component;

(2) a catalyst layer comprising

(a) an alkali metal,

(b) a heat-resistant inorganic oxide, and

(c) a noble metal loaded on the heat-resistant inorganic oxide, and

(3) an anchor substance present by being added separately as an anchor substance in the catalyst layer that reacts predominantly with said alkali metal when compared with main components of the honeycomb carrier and which is at least one member selected from the group consisting of B, Si, P, S, Cl, V, Cr, Mn, Ga, Ge, As, Se, Br, Zr, Mo, Sn, Sb, I and W, whereby any reaction between main components of the carrier and said alkali metal is suppressed and the deterioration of the carrier is suppressed.

14. A catalyst body according to Claim 12, wherein at least one member of the noble metal loaded on the heat-resistant inorganic oxide is selected from the group consisting of Pt, Pd and Rh.

15. A catalyst body according to Claim 12, wherein the main component of the carrier is cordierite.

IX. Evidence Appendix

None.

X. Related Proceedings Appendix

None.